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Hitch your Wagon to a Star.

COLONEL WARING may not have remembered this counsel of Emerson when he set out to clean the streets of New York; but he certainly began with a lofty aim, and of this the city was reminded in a striking way a few days since when his well-disciplined force of men and horses marched down Fifth Avenue under the eyes of applauding thousands and were ceremoniously reviewed by the Mayor. It was a remarkable spectacle when one imagined how impossible the mere idea of a "Street-cleaners' Parade" would have seemed two short years ago, and what one would have seen had the men and the carts and the horses of that time filed by in procession. It was an inspiring sight when it was recalled through what a storm of distrust and abuse Colonel Waring had to make his way when he proposed to turn politics out of his department, and especially when he put his men into uniforms—and white uniforms at that. The banner bearing the prosaic legend, "Four Hundred and Twenty Miles of Streets Cleaned Every Day," had an air of poetry to all who realized that those miles had really been cleaned, and beyond this one accomplished fact there stretched before the imagination unbounded possibilities of municipal improvement and refinement along a hundred hitherto untrodden paths.

Our streets are not yet as clean as streets should be; but the fault does not rest with the chief or with the men in white uniforms. It lies partly with our rough and ill-kept pavements, and partly with the untidy habits of our people. Therefore the astonishment with which our people beheld the manly-looking men, the well-bred, dignified officers, the neat, brightly painted carts and the well-groomed horses, which now are thought none too good for the humblest kind of municipal service, drove home a doubly significant lesson. Our people were taught respect for municipal work of every kind—for every sort of civic service; and let us hope, at least, they were taught that they should try to help the actual servants of the city in the prosecution of their tasks. Especially hopeful, from this point of view, was the presence in the parade of the school children, girls as well as boys, who have banded themselves together to keep watch over the cleanliness of our streets. For, it hardly needs saying that it is easier to train up children to be moral, in public as in private ways, than to reform the immorality of adults.

Colonel Waring aimed high when he insisted upon securing the best workmen to be had, put responsible educated men in control of them, and supplied his department with the best tools of every sort. Therefore the clean white uniforms on parade were not grotesque, but made an impressive and an instructive sight. The lessons thus taught do not hold good for New York alone, or for great cities alone. The spirit shown by the head of the Street-cleaning Department here should animate every city official all over the land, every town officer and every selectman or village ruler under whatever name. The intensely practical American people possess a deep vein of idealism. They are too busy to give much heed to its murmurs, but once a strong enough appeal is made, they respond with surprising alacrity. Our dump-cart has been hitched to a star, and so we are growing proud of our street-cleaners and more sensitive in regard to other municipal matters. Already the laborer has learned that a city's uniform is not a badge of slavery or inferiority, but, like a nation's uniform, a sign of respectability and honorable office. Looking at these white uniforms, the people understand that even a street-sweeper can be pleasant to behold, and that no servant of the public should be allowed to present himself before the public untidy. With the children to help us, we shall soon blush for our ill-kept pavements, shall grow ashamed to litter our streets with papers, shall take better care of our doorsteps and yards.

What a huge and hurried and overpopulated and necessarily dirt-amassing city like New York can do, and what its overbusy people can learn, surely may be done and learned in those country towns and little villages where the conditions are infinitely more favorable and the people are far less severely taxed in body and in mind. It is much easier to hitch the car of cleanliness, orderliness and beauty to a star in the country than in the town. Efforts to reach the highest ideal should be earnest and unrelaxing, but they are not worthy of the name if they are prosecuted in a hurry, or superficially. The aim should be the loftiest, but if workers are few and resources small, the field may well be limited. It is better to make one street as orderly and beautiful as possible than to putter about a dozen streets in an irregular, futile way. It is better to put a single little park or square into perfect condition than to make a couple of new paths and set out a few new trees and shrubs in every open space in the town. It is better to choose a single fine young tree of an appropriate sort, to plant it in the very best way, and to tend it carefully, than to choose a hundred carelessly, plant them cheaply and give them scant attention. It is better to cultivate a single Rose-bush lovingly than to fill a whole border with Rose-bushes and then neglect and starve them.

If the good taste of our people and their habits as to cleanliness and order are to be judged by the quality and care of their public buildings, public streets and public grounds we certainly need a good deal of education in this direction. The great proportion of our municipal and state buildings have little artistic value, their walls are scribbled over by idlers, and they are generally defaced, dirty and ill-kept. Few people ever think that it is a mark of untidiness to throw paper and other litter into the public streets. Indeed, most people toss rubbish of all sorts into the highways as if they were built as a receptacle for refuse. Unless watched by policemen, visitors in public parks too often break off armfuls of flowers and shrubs, walk on the grass borders where paths are provided, and never think that as part-owners of the place they ought to do as much to protect and beautify it as they would to their own private grounds. The object-lesson of clean streets here and the league of children to save them from becoming a dumping-ground for all that is unclean marks an era in our municipal history. It is not too much to expect that with such examples here and the work of village-improvement

societies all over the country the time will come when any one who willfully defaces a public building or litters up a public place will be looked upon as a criminal. Most surely, any one who does not respect the rights of society stands in the attitude of a public enemy. Society certainly has the right to demand that its highways and public grounds shall be kept clean and wholesome. One who is willfully guilty of the unspeakable nuisance which may fill the air with microbes of consumption and other diseases as surely deserves punishment as one who willfully pollutes the city water-supply.

Forms of Some European Conifers.—I.

THE Spruce, Picea excelsa, appears on the Swiss Alps in several remarkable forms which are not, strictly speaking, varieties, but peculiarities of development of the trunk or of the branches. I do not know if American dendrologists have observed analogous modifications in the Spruces which inhabit North America, but this subject would certainly be worth investigating.

As is well known, the normal form of the European Spruce has branches obliquely ascending or horizontal, with spreading branchlets. Among the trees of this type may be found, especially on steep declivities, a pendulous form with pendent branches and long, slightly branched, very slender branchlets descending vertically and giving to the tree the aspect of a Weeping Willow.

In another form, the pyramidal, the branches ascend at narrow angles, giving to the tree the habit of the fastigiate Cypress or of the Lombardy Poplar. Another special form is the strigosa, with very numerous slender horizontal branches furnished with numerous branchlets spreading from all sides of the branch. This form resembles the Larch in habit, often in a most remarkable manner.

A form which is rare in the Alps, but common in the north of Norway and Finland, near the northern limits of the range of the species, is columnaris. In this form the tree is small and feeble, with short tufted branches which form a narrow column. The Swedish botanists consider that this diminutive form is due to the effects of the early and severe cold of the winter which checks the growth of the branches. I only know this form in our Alps by a note and figure in the *Journal Suisse d'Economie Forestière* (1896, Number 4), but in this instance it is only the upper part of the tree which assumes the columnar form, while the lower part presents the ordinary aspect. Individual Spruce and Fir trees (Abies pectinata) often occur on the Alps of columnar habit, but these are usually large trees whose branches have been shortened by the attacks of insects.

Another form of the Spruce produced by exterior influence is the Nana, which is always striking from its regular pyramidal habit with short, slender, tufted branches, which have the appearance of having been trimmed by one of Louis the XIV.'s gardeners. Such trees are rarely more than six feet high, and their dwarf habit is due simply to the browsing of goats or of chamois, which in winter are frequently driven to food of this sort.

The inhabitants of the Alps distinguish by special names (Géants, Epicéas Protecteurs, Epicéas de Tempête, etc.) the individual trees which, near the upper limit of the forest, often stand alone in open pastures, where they frequently grow to an enormous size and from time immemorial have sheltered cattle and their guards from tempests.

The form furcata, with a trunk divided usually five or six feet above the surface of the ground into two or three stems, is not rare; but the most curious form is that which I shall call stolonifera. I have seen it only once in a park near Geneva, where there is a group of large trees growing on a gentle slope, with their long lower branches on the ground. At a considerable distance from the trunk these branches have rooted and produced saplings which have already grown to considerable size, one branch even repeating this phenomenon a second time at a considerable distance from the first point of rooting. This remarkable development, which resembles the growth of a Strawberry-plant from a stolon, has not been produced artificially, but is entirely natural, and the trees which are already old afford one of the most curious spectacles imaginable.

Bâle, Switzerland. *H. Christ.*

Plant Names of Indian Origin.—I.

IN a manuscript dictionary of North American plant names, of which I began the compilation many years ago at the suggestion of Dr. Gray, and which has reached voluminous proportions, there are many strange words, some of foreign and others of American origin, the meaning of which is not generally known. Many of these words have found their way into recent dictionaries, some unaccompanied with any explanation, while the etymology assigned to others is entirely erroneous. Among the unexplained native plant names there figure in considerable number words of aboriginal origin, which are invariably marked in dictionaries as "North American Indian," a very vague statement in view of the fact that within the limits of the United States alone there are represented fifty-eight distinct stocks or families of Indian languages that differ as radically from each other as they do from the Aryan or Semitic families. Of these linguistic stocks, the Algonkin, which occupied a much more extensive area than any other, has given us the majority of the plant names that are really of aboriginal origin (for all that are thus specified in dictionaries are not Indian). Next in point of numbers come names derived from the Aztec through Spanish; then those borrowed from the Carib dialects of the Greater and Lesser Antilles; then a few from South American Indian languages; and, finally, one or two each from the Timucuan, Muskhogean, Siouan, Salishan, Chinookan, Shahaptian, Shoshonean and Wakashan families of the southern and western states.

To *The Sun* (New York) of June 30th, 1895, I contributed an article on the words that have been introduced into English from the Indian languages of North America. These words were divided into three categories: (1) Animal Names, (2) Plant Names, and (3) Miscellaneous Words. Of most of the words of the first and third classes I gave translations, but of the plant names I offered merely a bare list, with the intention of elaborating this part of the subject at some time in the future and in some journal where the matter would meet the eye of those who are familiar with plants and their popular names, and to whom the subject is of more interest than it is to the general public.

I present the list, thus amplified, herewith, premising that a study of this kind is attended with considerable difficulty. Were there but a single family of Indian languages, the interpretation of any given word, unless it were a derivative from an archaic root of lost or uncertain meaning, would, after a study of the different dialects, be comparatively easy. But such being far from the case, and our Indian-English plant names having been borrowed from different linguistic sources, it becomes necessary in the first place to find out as nearly as possible where they originated (not always an easy matter), and then to ascertain the language now or formerly spoken in the locality; otherwise one might be led into gross error, for there are, perhaps, few Indian linguistic families that do not contain in their vocabulary words similar in sound (and in form when written) to words in another and entirely distinct language. Thus, to give but a single example, Wahoo is a Dakota (Siouan) name for a certain tree, another Wahoo is a Muscogee (Muskohegean) name for a tree also, while still another word, Wahoo, is the Micmac (Algonkin) name for an egg.

Having traced the word to the place of its origin and to the language to which it belongs, we may find, as in fact we sometimes do, that the language is extinct and has left behind it but meagre traces of its vocabulary, or that it has not as yet been sufficiently studied, radically and grammatically, to permit of an analysis of its words. Numerous

examples of such cases will be found in the following list. Much is gained, however, if the word has been properly assigned to the language to which it belongs.

Another difficulty is due to orthography, especially that used by the colonists, who, through a mishearing or misapprehension of the strange sounds of a strange language, wrote the same word in various forms, thus rendering its interpretation a question of the ear rather than of the eye. Good examples of this are afforded by the words Persimmon and Hickory.

The following list is, perhaps, not complete. I have omitted from it a few words that are found in books and are thought to be Indian (apparently for no other reason than that they are not English), but which require further study. In a study of North American plant names, it must not be forgotten that this country was settled by people of various nationalities, who naturally applied to our plants names derived from their own language. Among the numerous examples of such names may be mentioned Farkleberry, Fetterbush and Tupelo, a word that has always been thought to be Indian. Some of these foreign words have been so badly corrupted by English-speaking people as to be unrecognizable at first sight. As examples of such words I may mention Bilsted, Bonsemkrenia, Lash-Horn, Snargel, Sangrel, Klimmeth, etc. It must not be thought, then, that a word of uncouth appearance which is not English, and which apparently does not belong to any European language, is naturally North American Indian.

AMOLE (Chlorogalum pomeridianum).—A name transferred to the plant from that of a saponaceous pulp which is formed by bruising the alkaline and mucilaginous bulb, and which is used for washing clothes. The word is from *amolli*, or *hamolli*, the Aztec name for soap.

ATAMASCO (Zephyranthes Atamasco).—"The Indians in Virginia do call it Attamusco" (Parkinson, *Paradisus*, p. 87). The word means "stained with red," and alludes to the color of the flowers.

CAMASS (Camassia Fraseri).—A Chinook Jargon word, with variants: Camas, Cammas, Quamash and Quamish. The name is from Nootka (Wakashan) *chamassish*, "sweet-tasted," alluding to the saccharine taste of the bulb when cooked.

CANCHALAGUA (Erythræa venusta), and also a general name for the various species of the genus in California, as well as in Panama, Ecuador and Chili. The name is a Spanish corruption of Araucanian (Chilian), *cachan-lahuen*, meaning "pleurisy herb."

CASHAW, or CUSHAW (Cucurbita verrucosa).—The "Cushaws," says Beverly (*Hist. Virginia*, ed. 1705, p. 27), "are a kind of Pompion, of a bluish green color, streaked with white, when they are fit for use. They are larger than the Pompions, and have a long narrow neck." Beverly adds that "perhaps this may be the Ecushaw of J. Hariot"; and Dr. J. H. Trumbull (*Bull. Torrey Bot. Club*, vi., 71) remarks that "in Hariot's *Virginia* the name [Cushaw] is given as Ecushaw." But these references are erroneous, since no such word as Ecushaw occurs in Hariot's *Briefe and true report of the new found land of Virginia* (1585). Nevertheless, in order to account for the name Cashaw, or Cushaw, we must suppose the former existence of the Virginian (Algonkin) word *ecushaw*, or *escushaw* (properly *askushaw*; Cree, *askisiw*), which would mean "it is green," "unripe"; from the same root as the word Squash, *q. v.* Bartlett (*Dict. of Americanisms*) notes that the word is sometimes spelled Kershaw.

CASSENA (Ilex vomitoria) —From *cassiné* (as spelled by the French explorers of Florida in the sixteenth century), a name in the language of the Timucua Indians (a family long ago extinct) for an exhilarating beverage prepared from the leaves of the plant. The word has the appearance of having been borrowed, and modified by a prefix and suffix, from the Muscogee name *ássi*, "leaves," abbreviated from *ássi lupútski*, "little leaves." The Timucua borrowed several terms from the Muskhogean dialects.

New York. *W. R. Gerard.*

Foreign Correspondence.

Rhododendrons and Azaleas.

THE Rhododendrons are now at their highest state of perfection, and for many years there has not been such a profusion of bloom as this season, doubtless owing to the dry and warm summer of last year, which conduced to the formation of flower-buds instead of the growth of the plants. The public gardens and parks about London are brilliant with Rhododendrons and Azaleas, and especially Hyde Park, where, each year, a special feature is made of the finest specimens of the best sorts from the famous Knap Hill nurseries, in Surrey. This year Azaleas and Rhododendrons have mingled in bloom in a remarkable way, for generally Azaleas are past their best before the Rhododendrons are fairly out. One hears divided opinions as to their respective merits, and popular favor leans decidedly toward Azaleas now that the great number of varieties show so many subtle shades in their brilliant tints. But, really, they should not be compared with each other, and it is best to separate them, as is done at Kew, where in the Azalea garden one can only have a distant glimpse of the Rhododendrons. This principle should be followed whether planting on a large or small scale. This week I was one of the multitude who visited the famous Knap Hill nurseries, where the display of Rhododendrons excels that to be seen anywhere else in England. Here many acres of these American plants make a sea of bloom, the variety and brilliancy of which form a scene of indescribable beauty. Each year I think it quite the most impressive floral sight I have seen anywhere. But I went to Knap Hill especially to see the novelties that are sure to appear each season in such a vast collection, where systematic hybridizing is carried out thoroughly. Having regard to the multitude of splendid named varieties the standard of perfection is necessarily a high one with Mr. Anthony Waterer. Every seedling that does not conform to his ideal is rejected, although many persons might regard some of the rejected seedlings worthy of a name on account of the color or some exceptionally fine feature. In his opinion the perfect Rhododendron must first of all be of good constitution, with large and broad foliage, which he generally secures by breeding from the Catawbiense type. The flower-truss must be massive and a perfect cone and the flowers large, of perfect form and with short foot-stalks, so as to hold themselves together and not be injured by wind or rain. Then, if the seedling conforms to all these conditions and proves itself distinct in color from any known named variety it is given a name. To any one with a less fastidious taste than Mr. Waterer there are at least a score of new seedlings that are well worthy of a name, but probably only a fourth of that number will be so distinguished, and the others will be sold as unnamed seedlings. Two of the seedlings were named on the day of my visit. These were G. A. Sims and Nancy Waterer. The first is quite the most brilliant hybrid Rhododendron I have seen, and is almost of the same tint as the original R. arboreum. It is almost needless to state that it has high qualities in size of truss and flower and luxuriant foliage. Its color stands out the most striking among a thousand others. The Nancy Waterer variety, on the other hand, is remarkable for delicacy of tint, and is, perhaps, now the finest of the white and spotted-flowered class. It has a huge truss, and the immense flat flowers show spreading petals of a pure warm white, the upper petal adorned with a large and conspicuous blotch of rufous tint. Both these superb varieties will, no doubt, be distributed this season. A seedling will probably be selected to be named Persimmon, after the winner of this year's Derby, it being Mr. Waterer's invariable custom to name a Rhododendron after the winner of this classic race. It is a good practice, as it fixes the date of a new variety. I believe the only exception to this custom was the year when the horse Common won the Derby. It was, perhaps, thought that the name might be misconstrued.

Passing from the seedling-ground we were showed about

in the general collection, and it would be a difficult task to mention all the splendid sorts that fixed my attention there. A few first-class kinds which Mr. Waterer named as peculiarly adapted to gardens in America were Mrs. C. S. Sargent, one of the loveliest of all varieties, best described as a pink Everestianum, as it partakes of all the good qualities of that sort; F. L. Ames, Mrs. S. Simpson, Mrs. Hunnewell, Mrs. Price Lade, Lady Gray Egerton, Mrs. R. S. Holford, Sigismund Rucker, Sappho, J. Marshall Brooks, Martin H. Sutton, Marchioness of Lansdowne, H. W. Sargent, H. H. Hunnewell, Harry Veitch, C. S. Sargent. The last named is in bud this week, and is valuable on account of its lateness.

The seedling Azaleas, to the crossing and raising of which Mr. Waterer has given so much time and care of late years, are wonderful, all the more so, considering the scanty material that has been worked upon. In size of flower they rival the Rhododendrons, while for exquisite and subtle shades of tint they are beyond description. One sees the most fiery scarlets, the richest yellows, the purest whites, and every gradation of color between these extremes. Unfortunately, none of these seedlings can be described individually by name, as Mr. Waterer is even more reserved in naming the Azaleas than the Rhododendrons. Only a few of extraordinary merit are so distinguished. So many worthless old varieties are named that all but those having the highest qualities are sent out simply as Knap Hill Azaleas. I am inclined to think that some sorts of exceptional merit will receive names this year, especially some of the very large flat-flowered forms, and a new type of double-flowered sorts that I saw for the first time. One of these has a dense cluster of clear pink flowers on long branches that recall at once some of the finer sorts of double-flowered ivy-leaved Pelargoniums. These double flowers last so long and carry their blooms so well that they are especially adapted for cutting, and will some day be a valuable addition to market florists for cut flowers.

At Kew and a few other places this year a great feature among Rhododendrons has been the new race of hybrids that have sprung from the Fortunei type. They afford a a new phase of beauty as regards form of flower and color, but do not conform in truss with the standard fixed for the other race. The flowers have long foot stalks and loose trusses, and therefore cannot hold themselves up in rough weather. They are, nevertheless, a decided gain, and it is only a matter of time to remedy the defects if careful selection and crossing is persevered in. At Kew some of these hybrids have been lovely, particularly those recently named Mrs. Thiselton Dyer and F. Thiselton Dyer. According to Mr. Watson they are the result of intercrossing R. Fortunei and R. Thomsoni. They are of luxuriant growth and have large trusses of widely open flowers, ranging from a blush white to a deep rosy red, and invariably a conspicuous blotch of carmine on the upper petal and a blotch of deeper hue at the base of the corolla. Mr. George Paul, of the Cheshunt Rose nursery, has been working at these hybrids in the same direction, and he has produced some remarkable ones which may in time become first-rate varieties. I do not think these will be suitable for America, except in the western and southern states, as they flower much earlier than the Catawbiense and other hybrids.

Roses.—The long spell of drought and heat has retarded the opening of buds on Roses, and the plants have had a hard struggle with insect pests, but there is one race of Roses that seems to defy these drawbacks and is on the high tide of beauty. These are the Ramanas Rose hybrids, Rosa rugosa, and no flowers are more delightful at Kew this week. Two of the Continental varieties are flowering profusely. One is a pure double white named Coubert. It is much like R. rugosa in habit of foliage, more dwarf and bushy, while every shoot carries a cluster of deliciously scented flowers of the purest white. The other variety is Belle Poitévine, which is like Coubert in habit, but the semidouble flowers are carmine-purple and scented. These are first-rate garden Roses, as they continue a long time in bloom. Two other hybrids are quite distinct from the latter in growth, as they tend rather to a rambling habit and long shoots. These are the Dawson and Mrs. A. Waterer. The Dawson has pale rosy pink flowers in profusion all along its spreading slender shoots. Mrs. A. Waterer is a cross between R. rugosa and General Jacqueminot, and was raised some years ago by Mr. A. Waterer, Jr., at Knap Hill. It is a spreading grower, and every shoot is densely wreathed with double flowers of a deep crimson and possesses a most powerful perfume. These two Roses are unquestionably among the finest we have for planting in places where they can spread about in a free way. All who see them are charmed with them. I wrote last week about Paul's Carmine Pillar Rose, which is the finest early variety I know, the profusion of large, single, brilliant crimson flowers being highly effective. It is still in perfection, and is associated this week with Crimson Rambler, which bids fair to become one of the commonest garden Roses. Every garden should include this half dozen Roses.

We are having a glorious season for trees and shrubs, and some Magnolias have never been finer in this country. We are now enjoying the grand American species, M. tripetala and M. Fraseri, both noble trees in or out of flower. The aromatic fragrance of these two Magnolias and of M. glauca perfumes the Azalea garden at Kew. The most remarkable flowering shrubs at Kew this week are the dwarf Leguminoseæ, Cytisus scoparius Andreana, quite the most beautiful of its tribe, and in splendid condition this year. There are two new hybrid Cytisus raised at Kew worthy of special notice. One has been named C. Kewensis. It is a cross between C. Ardoini and C. alba, and is quite intermediate between those species as regards the flower, which is about the size of that of C. alba and pale yellow in color. It is distinct from either in habit, being quite prostrate, and spreading on the ground. There is a mass a yard across, and the flowers are so profuse that the foliage, which is trifoliate, is hidden. This is a valuable acquisition among dwarf shrubs for the rock garden, or on any position where its slender shoots can fall over a ledge to display the graceful growth of the plant. Another form of it from the same cross differs in the much deeper yellow and rufous color of its blossoms.

Kew. *William Goldring.*

Plant Notes.

Styrax grandifolia.—The so-called large-leaved Styrax, although a native shrub, is rarely seen in American gardens. It is a first-class ornamental plant and should be better known. It has recently been in blossom in the Meehan nurseries in Germantown, Pennsylvania, and its white flowers are well set off by the large and generally obovate leaves, which are green above and soft gray and downy beneath. The blossoms are borne on elongated racemes and they open successively from the base toward the tip, so that flowers near the apex are still opening long after those first expanded have fallen. It is a large, vigorous shrub when well grown, sometimes attaining ten or twelve feet in height, but it only reaches its best development in the southern states, where it is most at home. Although it will grow well in many places where the climate is not much more severe than at Philadelphia, it is not likely to thrive much farther north than New York, and is not generally considered hardy in New England.

Styrax Americana is more dwarf and more hardy than S. grandifolia and will live and flower a good deal farther north. It flowers at the same time as S. grandifolia. The pure white flowers are open, bell-shaped, pendulous, solitary, or in very short and few-flowered racemes, and they have a faint but distinct and sweet fragrance. The leaves are small, or from one-third to one-half the size of those of S. grandifolia, and they are green and smooth or nearly smooth on both surfaces. The habit of the plant is open, and it will thrive as far north as Massachusetts without protection in winter, although it is not found wild north of Virginia.

PHELLODENDRON AMURENSE.—This tree, which in general appearance resembles the Ailanthus, and is almost as rapid a grower, has proved itself desirable for street-planting. It is especially valuable for the southern and western states. Insects do not appear to attack it, probably owing to the rank balsamic odor of the sap. The leaves, which are pinnate, with a terminal leaflet, sometimes attain a length of more than three feet. The trees are dicœcious, and the fruit, which is freely produced when the sexes are in close proximity, is small and borne in clusters, which are almost black when ripe. Phellodendron amurense is also known as the Chinese Cork-tree. It is perfectly hardy about Philadelphia and as far north as central Massachusetts.

Clematis Suksdorfii (see illustration on this page) was first distinguished by Mr. W. N. Suksdorf, who found it in July, 1881, on the banks of the Klickitat River, in Washington.*

Cultural Department.

Notes from the Herbaceous Border.

HEMEROCALLIS DUMORTIERI is a distinct, free-growing, ornamental, hardy perennial. It is more floriferous than H. flava, although, perhaps, the flowers are not quite so pleasing in color. It grows fast in a suitable position, and small plants obtained a few years ago are now two feet in diameter. One of these plants has just borne seventy flower-scapes. H. Dumortieri has long, narrow, tapering deep green leaves, measuring eighteen inches or slightly more in length. The numerous flower-scapes are nearly erect, about two feet in length, and they comprise three or four flowers. The individual flowers are of good size, orange-yellow and tinged with brown on the outside. Like all other Day Lilies, the flowers are ephemeral, but they open in succession and the scapes do not all blossom at the same time. The flowers lack the fragrance of those of H. flava. It is a fast grower, and for large specimens the plants should not be crowded. A fairly rich soil, and not too much shade, suits it well. This Day Lily is a native of Japan and eastern Siberia. It is also known by the specific names rutilans and Sieboldii. H. flava has blossomed

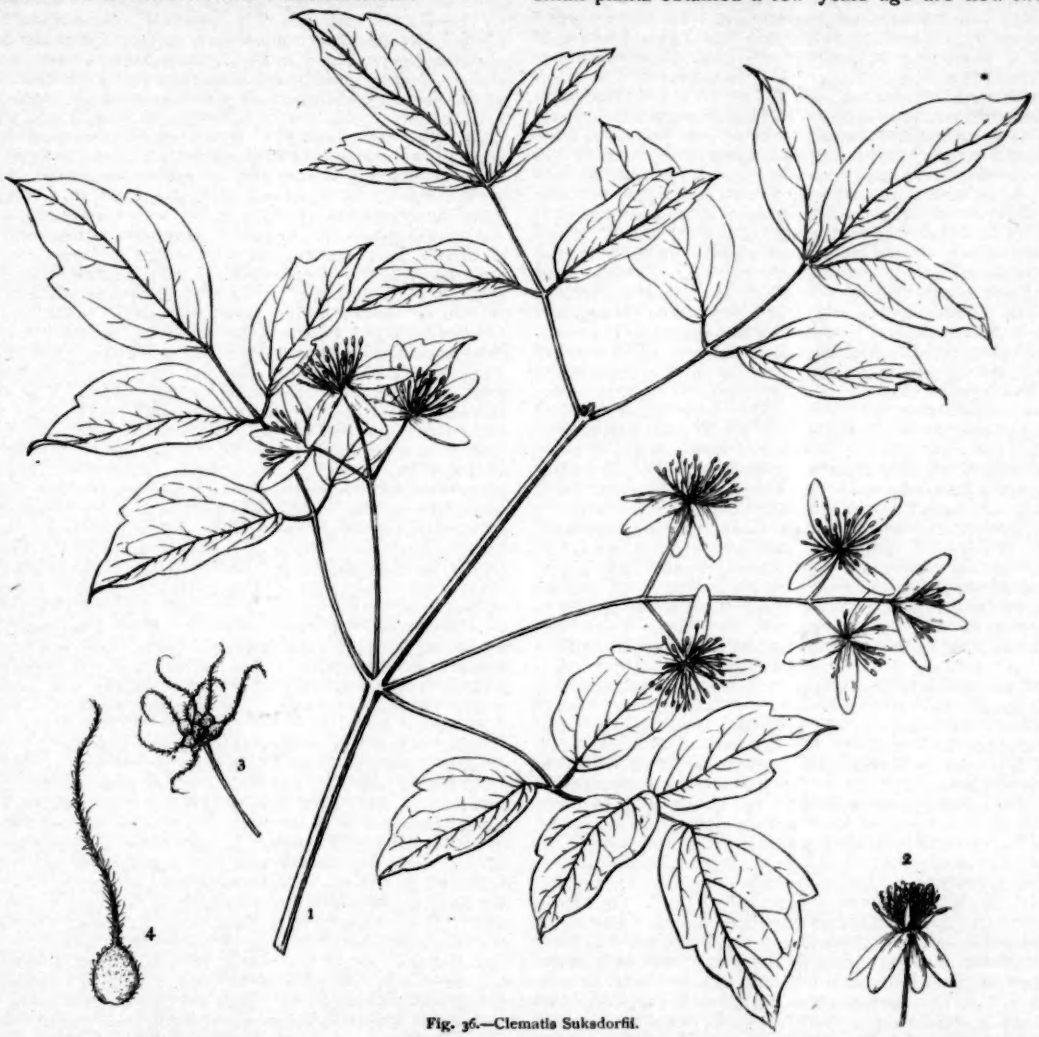

Fig. 36.—Clematis Suksdorfii.

1. A flowering branch, natural size. 2. A flower, natural size. 3. A fruiting carpel, natural size. 4. A head of fruits, natural size.

New or Little-known Plants.

Clematis Suksdorfii.

THIS little-known Clematis of the Flammula section resembles in habit and foliage the widely distributed and variable Clematis ligusticifolia, the western representative of our common eastern Virgin's Bower. From Clematis ligusticifolia it appears to differ in its much smaller and fewer-fruited carpels, the ripe heads being not more than an inch in diameter, including the curling tails. The leaves are quinate, with glabrous leaflets from an inch to an inch and a half in length, and the spreading or reflexed white sepals are coated with pubescence on the lower surface.

* Robinson, *Syn. Fl. N. Am.*, I., pt. I., 41 (1895).

well this year, and its large, clear yellow fragrant flowers are conspicuous at a considerable distance.

Some of the Pentstemons are beautiful now. The more tender species are unsatisfactory when grown all the year through in the border. They succeed the first year after being raised from seed, but if left in the border during winter the plants are weak in the spring and do not grow satisfactorily the second year. However, many of them will stand lifting in the fall, and they keep well in a cold frame during the winter. Whenever the ground is suitable for working in spring they can be planted in the border again, where they soon begin to grow. Other beautiful tender species make stronger, healthier and more compact plants if raised annually from seeds sown in January.

Fortunately, we have a number of species as hardy and as easily grown as our commonest perennials. Those with weak constitutions are, however, well worth this extra trouble of lifting, as is shown by a batch of the beautiful Pentstemon secundiflorus now in bloom here. The height of this Pentstemon is about fifteen inches, and the stems are clothed with narrow, smooth, lanceolate leaves. The flowers are in long panicles. The showy corolla is fully one inch long and of a mauve-purple color. This handsome species is found in the mountains of Colorado, and is said to be common at an altitude of eight or nine thousand feet. P. diffusus is quite hardy here and is flowering freely now. In spring the plants are cut well back and all the dead and weak growths removed. They soon make young shoots with nice healthy foliage. It is a vigorous grower and has stems nearly two feet in height, with opposite dark green oblong-lanceolate and deeply serrated leaves. The flowers are of a light purple color, showy, are produced in dense panicles and last for some time. P. pubescens is another reliable species easy to grow. The flowers of this plant are in pleasing contrast with those of the other Pentstemons now in blossom. There seem to be two forms of P. pubescens; one which we have here grows nearly two feet in height, while the other hardly reaches a foot. The leaves are light green; the lower ones measure more than three inches and are lanceolate in shape. The drooping flowers are in a loose thyrse. The upper part of the corolla is of a dull purple, and the lower half of a whitish color. P. ovatus is perfectly hardy, growing from two to three feet high, with short thyrses of rather small showy purple flowers. P. lævigatus digitalis makes fine vigorous plants and has flower-stems a yard long, with plenty of whitish flowers. The dwarf plants of P. confertus (cœrulea-purpurea) bear pretty blue-purple and violet-colored flowers. P. Clevelandi has showy crimson flowers, but the plants do not seem to be perfectly at home here.

The Bellflowers are beginning to blossom, and they are always pleasing and attractive. The strong-growing kinds grow well in any ordinary well-enriched garden soil. The dwarf kinds are best adapted for the rock garden, although some of them, such as Campanula Carpathica and its varieties, are among our best plants for the front row of the herbaceous border. The Peach-leaved Bellflower, C. persicifolia, has opened its blue flowers in long showy racemes. Its white variety is an extremely handsome perennial, and always attracts a great deal of attention at this season. C. Sibirica is a biennial hardy species, floriferous, and making a neat and compact plant. Its height makes it especially useful. Its stems are branched and measure about eighteen inches. The large flowers are purple-violet in color and are produced in panicles. C. latifolia macranth is a thrifty plant with long stout stems three to four feet high. When well flowered it is a handsome sort. The flowers are large, of a purplish blue color and are in a spicate raceme. C. nobilis is a distinct plant about two feet high, and the form now in bloom has reddish violet flowers. C. Portenschlagina is a dwarf species suitable for the rock garden. At this time it is one mass of almost erect, small, light blue-purple flowers. It does best if it has a slight protection in the winter.

Salvia argentea, now in flower, is a bold silvery leaved biennial from southern Europe. It has distinct and attractive foliage, and small groups of the plants in the border are very noticeable. Its leaves are large, wrinkled, lobed and silvery, and vary in size from six inches to one foot in length; both sides of the leaf are covered with loose white wool. The height of the plant when in bloom is about three feet. The flowers are produced in whorls of from six to ten flowers in large panicles. The corolla is of a whitish color. The plant is more valuable for use as a foliage plant than for its flowers.

The Phyteumas are blooming better this year than they have done for some time. The showiest one in bloom is P. Schenchzeri, a plant from the European Alps, and it is quite hardy here. It is about one foot in height, with ovate-lanceolate leaves, and those on the stem are linear lanceolate. The deep blue flowers are produced plentifully in spherical heads. Other species flowering now, and with blossoms of the same color as the above plant, are P. Michelli and its variety, with long narrow leaves, and P. orbiculare. They do best here in the rock garden in a position where they get plenty of light, although they grow fairly well in the border in well-drained soil.

The blossoms or flower-heads of Helenium Hoopesii are still in good condition on the same plants of which I wrote three weeks ago. The lasting qualities of the flower-heads of this handsome Compositæ are excellent.

Botanic Garden, Harvard University. *R. Cameron.*

The Rock Garden.

THE rock garden continues attractive. Scattered patches of the Alpine Bugle, Ajuga Genevensis, are very handsome, and no blue-flowered rock plant can compare with it in depth of color—a rich indigo-blue. This species is the best of the genus, but all are pretty. A. pyramidalis is a giant among them, with spikes nearly a foot long, in whorls of light blue, labiate flowers. A bronzy leaved form of A. pyramidalis is used extensively in England for spring bedding. A. reptans, in the typical form, is, perhaps, the least attractive, but the white-flowered variety and the one with variegated leaves are well worth growing. Gypsophila repens is neat and pretty at all times. Just now its glaucous foliage is almost covered with the small starry white flowers. G. cerastioides, from the Himalayas, is scarcely hardy; whatever growth is made in summer is lost in winter, and it soon dies out. Some Rock Roses (Helianthemum) were lost last winter in exposed places. The orange-colored varieties appear to be hardier than the purple varieties. Callirrhoë involucrata, the Poppy Mallow of the west, is one of the prettiest of trailing plants. The stems are annual, and all start from a parsnip-like root-stock. The flowers are rose-colored, with a white centre, and arise, scape-like, from the axils of the leaves, throughout the length of the stems, from spring until autumn. It is an admirable little plant and can be confidently recommended for planting on rather dry slopes. The roots die out in a few years, but there are always seedlings enough to take their places. Poppies are general favorites. Though many of them are strictly border plants, all fit in well in the bolder groups on the rock garden. Blue Columbines, yellow Day Lilies and scarlet Poppies, especially the new hybrids of P. orientale, all go well together. In another group we may have the yellow Foxglove, Digitalis ambigua, Geranium Ibericum platypetalum, Violets with handsomely digitately palmate leaves, and Iceland Poppies. Such groups among carpets of Phlox subulata and other plants which scarcely rise above the ground make very interesting contrasts.

Aster alpinus speciosus is by far the best of all the dwarf perennial Asters. The flowers are nearly two inches in diameter, with a large yellow disk and mauve-colored ray-florets. It is hard to distinguish many of the single-flowered Dianthus, especially those with deeply fringed flowers, and which come from the Alps of Europe. D. arenarius, D. Monspessulanus, D. fragrans, D. suavis and D. squarrosus are names of kinds we have had. These varieties have merged so much in the seedling forms that it is difficult to make sure of their identity. D. atrorubens is distinct, with heads of deep red flowers; D. latifolius is a strong-growing kind, with large flowers. The Indian Pink, D. Chinensis, common now, is really beautiful, especially the single varieties. Although grown mostly as annuals, we have had plants live for several years. D. deltoides, the Maiden's Pink, is beautiful, and when once established takes care of itself. The Fire Pink, Silene Virginica, does well here. It must be allowed to run wild, as under cultivation it is difficult to grow. It is little more than a biennial, and it needs to be planted where it can sow itself freely. It is now perfectly at home in shady spots it has found for itself.

Astragalus Monspessulanus is represented here now by only one good plant. This subshrubby member of the Milk Vetch family should last for years, and go on increasing in size if favorably situated. Evidently we have not yet found its needs. It is uncertain whether summer's heat or winter's cold does most harm; it is to be noted, however, that the plants ripen prematurely, and it may be that the summers are too hot. The leaves are handsomely pinnate and arise from a creeping root-stock. The pink, pea-like flowers occur in short, decumbent spikes laid among the leaves with pretty effect. Violas include an interesting number of varieties and hybrids of Viola cornuta in white, yellow, violet and purple colors. They are showy, but short-lived; generally we have plenty of seedlings. The

Horned Rampions, Phyteumas, are interesting and lovely allies of the Bellworts, Campanulas. Phyteuma Michellii is a neat tufted kind, with blue flowers in heads on stalks nearly a foot long. In the bud state the corollas appear pointed. This peculiar pointed condition continues for a long time, for even when the flowers are open it is only in the lower part of the corolla that the lobes separate, and often the tips remain united when the function of blossoming is past.

Campanula Carpathica in several varieties is now opening, with its allies C. cœspitosa and C. turbinata. These will continue until frost. Œnothera Missouriensis opened its first flowers a few days ago. They are altogether out of proportion to the size of the plant; in fact, I do not know another Evening Primrose with flowers as large. The large-winged capsules are also remarkable, and on this account it was once named macrocarpa. Ramondia Pyrenaica has been in bloom for nearly a month. The flowers are few, on branched scapes, rotate, and violet-colored. It is, perhaps, more interesting than beautiful. It is the Rosette Mullein and was once named Verbascum myconi. It grows on the Pyrenees and in fissures of rock, often facing vertically, and is considered a difficult plant in cultivation; as is often the case with other plants difficult to grow, we are liable to set down the cause to the severity of the winter.

Wellesley, Mass. *T. D. Hatfield.*

Clerodendrons.

AMONG the many summer-flowering plants well adapted for conservatory decoration few are more showy than the climbing Clerodendrons, and while these are by no means new plants, they are uncommon enough to attract attention when well grown. They are not difficult to cultivate; liberal treatment during the growing season and a subsequent period of rest to ripen the wood are among the chief requisites.

Where space will permit, these plants may be planted out in a prepared bed and trained up on a trellis or on wires strung along the roof of the house. Grown in this way they are, however, less under control in regard to the time of blooming, and pot-culture is for this reason more convenient. By liberal treatment is implied a rich soil, abundant moisture and a fair amount of heat. But little shading will be found necessary at any season, except during the period of flowering, when some protection from strong sunshine will help to prolong the life of the flowers.

The Clerodendrons are strong-rooting plants and require a fair amount of pot-room. Young plants may be shifted on quite rapidly at this season, using as a foundation for the compost some good loam, to which should be added a sprinkling of sand, a small proportion of bone-dust and about one-sixth of dry cow-manure. If the loam is inclined to be clayey I prefer to use a portion of peat with it in order to render it more open, but this is not necessary with friable, turfy loam. As the growth progresses the shoots should be supported by stakes, wires or strings, and thorough syringing will be required to prevent the attack of red spiders. By September the growth will be sufficiently advanced to begin the ripening process; this is brought about by gradually withholding water and giving abundant ventilation. The plants may be held in this dormant condition until spring by keeping them dry and in a temperature of about fifty-five degrees. They should then be pruned moderately, the growths tied down to a suitable trellis, and with thorough watering and frequent syringing a good break of flowering shoots will result.

Nothing has been said about repotting the plants in the spring; it is preferable to defer this operation until after the plants have bloomed; otherwise a rank growth of wood and few flowers is likely to be the result.

The propagation of the climbing Clerodendrons is quite easy, and may be effected either by cuttings of two or more joints in length, and formed from firm young growths, or by means of root-cuttings. The latter should be made from the thicker roots, cut up into about two-inch lengths and buried to a depth of half an inch in pots of sand or in sandy soil. In either case the cuttings should be placed in a warm propagating-frame.

Among the species and varieties to which these notes will best apply are the well-known Clerodendron Thompsonæ; this is probably the most abundant bloomer of them all, and produces panicles of bright crimson flowers which project from showy pure white calyces. C. splendens, a strong-growing and large-leaved species with scarlet flowers, and the form known as C. speciosissima, which is an improvement on its parent, C. speciosa, is stated to be a hybrid between C. Thompsonæ and C. splendens, and is also an admirable variety; the flowers are deep rose in color, and the calyces are also somewhat tinted with a similar color.

Holmesburg, Pa. *W. H. Taplin.*

Strawberries.

OUR first gathering of this fruit was made this year on May 30th, fully a week earlier than in ordinary seasons. The earliest sort to ripen was Leader, which came in three days before Michel's Early. Leader has proved itself much the best variety with us; its berries are of good size and form, and of a fine rich crimson color. In flavor and quality Michel's Early is, however, slightly superior. For our main crop we grow chiefly Bubach No. 5, Belmont and Marshall. Marshall did rather indifferently with us last year and the foliage was badly affected with leaf-blight during the autumn. It stood the winter as well as any kind, and this year is giving a heavy crop of large, handsome berries, the two-year-old plants being especially thrifty. For exhibition purposes Marshall is the best strawberry of which I know, and some marvelously fine dishes have been shown at the Boston Strawberry show during the past three seasons. Complaints are quite general, however, that it winter-kills badly and is not a profitable variety for market-growers to handle. It is a vigorous grower and is easily distinguishable from any other sort. The fruit is of a beautiful rich crimson color and of fine flavor. Bubach No. 5 and Belmont are more grown in this locality than any other varieties. The extensive Strawberry fields in Dighton, Massachusetts, which supply Boston and other large New England markets, grow more of these two sorts than of all others combined. We have tried Parker Earle for two seasons; it is a good late variety and sets an immense quantity of fruit, more, in fact, than it can properly mature. It is usurping Sharpless to some extent, although a little inferior in flavor. Timbrell is proving an extremely productive sort, of superior flavor, but the rather peculiar mottled appearance of the fruit will operate against its being grown extensively for market.

We begin to layer our plants for a new plantation about June 20th, using three and four inch pots for the purpose. We do not sink these pots in the ground, and one good watering a day suffices when they are stood on the surface. As soon as the pots commence to fill with roots we remove the plants and stand them in a batch where they can be more conveniently watered. We like to have the plants set out by August. The earlier this is done the better the prospects are for a fine crop the following year. We plant in heavily manured ground, allowing the plants eighteen inches apart in the rows and the same distance between the rows. Between every fourth row we leave a two-foot path. We do not find it profitable to fruit the plants more than two seasons. The finest fruit is produced the first season, but two-year-old plants give the heaviest yield. After planting out our runners we give the bed a thorough soaking of water, and also whenever the ground becomes dry while the plants continue to grow.

Taunton, Mass. *W. N. Craig.*

Correspondence.

A Garden of Single Roses.

To the Editor of GARDEN AND FOREST:

Sir,—Although the many different varieties of single Roses have often been described in GARDEN AND FOREST, it may be of interest to some to know the result of a small garden formed of the different varieties of these plants.

In the spring of 1894, about twenty small Roses were planted, mainly obtained from the Arnold Arboretum, and after two seasons most of these plants have become good bushy specimens, covered with bloom each spring. While some of these, especially the Japanese varieties, are well known, most of them are seldom seen, except in our public parks, where they make a fine effect planted in large masses.

The earliest Rose in my collection is the European Rosa alpina, a plant of vigorous growth, forming a large dense bush of a somewhat stiff habit. Its foliage is a pleasing light green, and it seems to be well adapted for a garden hedge. It is closely followed by Rosa blanda, a charming plant of graceful habit; both of these Roses have fine pink flowers, with but few thorns, and are well worth growing. Another early Rose, and perhaps the best of all, is the Scotch Rose, Rosa spinosissima, a low-growing plant with fine dark foliage, and an object of great beauty when covered with its garlands of white flowers. Its foliage is retained very late in the autumn, and this makes it especially valuable. There is a counterpart of this Rose

called Rosa grandiflora, the only apparent difference being the larger size of the flowers borne by the latter.

After these early Roses, the better-known Japanese Rosa rugosa appears, the white form of which is excellent. It has the advantage of being a constant bloomer, and, near the sea, it is covered in autumn with large, showy hips. Also from Japan is the large-growing Rosa multiflora, its innumerable tiny white flowers greatly resembling the bloom of the Blackberry. It is equally valuable grown as a large bush or as a climber. Another pretty plant that can be treated in the same way is the Field Rose, Rosa repens, with its modest white flowers and delicate foliage.

Among the more striking Roses the Copper Austrian Brier, Rosa lutea punicea, easily heads the list, with petals scarlet above and yellow beneath, while Rosa rubrifolia is conspicuous on account of the deep purple color of its foliage. If a suitable place can be found for Rosa Wichuraiana to grow in it will certainly be of great value, with its fine glossy foliage and small white flowers. At Dosoris it has been grown successfully as a climber, but treated in this way here its long shoots were killed during the past winter, although other plants allowed to creep on the ground were uninjured. We have but one native climbing Rose hardy in the north, Rosa setigera, but it is one of great beauty, blooming when most other Roses are past. Grown on a trellis, or allowed to hang over a steep bank, it forms a handsome object with its large pink flowers. Rosa lucida and Rosa Carolina, our native upland and lowland Roses, are both well worth growing, especially the former, which makes a large, strong bush, with fine glossy foliage. Last, but not least, is the well-known Sweetbrier, Rosa rubiginosa, which has made itself so much at home in our fields and pastures as to be almost a native, and whose delightful odor permeates the whole garden. Last year a set of hybrids from this Rose was sent from England that promise to be of great value. Although a large bush of the common Sweetbrier was badly injured by the unusually severe winter, these small plants are all in good condition and are now coming into bloom. They fully equal the description accompanying them. They have all retained the delightful Brier odor and are of a great variety of color. The best one I have is the variety called Lord Penzance, resembling somewhat the Copper Austrian Brier, in paler tones, with the same combination of yellow and deep red. Lady Penzance is a very light pink, delicately shaded with yellow. Meg Merrilles is a deep crimson, while Lucy Ashton is almost white. If these Roses prove to be as vigorous in growth and as free bloomers as the common type they will be a most welcome and valuable addition to our gardens.

Of course, a list of this character could be almost indefinitely extended, but those I have mentioned will make a collection of considerable variety, and include, I believe, the most distinctive forms. All of these are hardy at Boston, and are not particular about soil or treatment, and, with me at least, have few enemies of any importance. If it is not considered desirable to grow them by themselves, they make excellent subjects for the general shrubbery. A little farther south the list could be greatly extended, especially by the addition of Rosa moschata nivea. This beautiful Rose, after passing through two winters with but slight injury, was killed to the ground this year. It is strong-growing, throwing out arching stems from six to eight feet long, covered with white flowers of great beauty.

There have been many hybrids formed lately from these Roses, one well-known one, the Dawson Rose, having small semidouble pink flowers and retaining the habit and hardiness of its parent, Rosa multiflora. A pink form of R. Wichuraiana has, I believe, been created, and undoubtedly many more will follow.

As an edging for the larger-growing Roses, the small Fairy Roses, Rosa polyantha, can be used. Unfortunately, these Roses are not very hardy, but they are so easily grown from cuttings that they should be more generally planted.

Wellesley, Mass. *H. S. H.*

Climbers and other Plants in Northampton.

To the Editor of Garden and Forest:

Sir,—A Wistaria Chinensis sixty-five feet high and covering a width of thirty-five feet, is not often met with in this country, but a plant of the above dimensions is now growing on a southern exposure against the main building of the State Lunatic Asylum, located at Northampton, Massachusetts. The stem at eighteen inches from the ground is three feet in circumference, and Mr. J. Thornley, the head gardener, informed me that the vine was planted there twenty-seven years ago, and that a year ago more than one-half was cut away to make room for needed improvements to the building. It is very vigorous and looks as though it would, if allowed, soon cover the whole building. It is a magnificent sight when in full bloom, but this year, owing to the unusual winter, it has not produced half the usual number of blossoms.

On an eastern aspect of the same building is a fine specimen of the climbing Hydrangea, Schizophragma hydrangeoides, which occupies a space forty-five feet high by about thirty wide. It is now in full bloom, and a magnificent sight with its large corymbs of Hydrangea-like blossoms against the dark, shining green leaves. For a large building of brick or stone this climber, in my opinion, is without a peer. It requires no attention in the matter of pruning or training, as it clings to the walls by its aerial roots, and is perfectly hardy. It is a native of Japan, and is easily propagated by cuttings or seeds. This vine was planted about thirteen years ago, but must soon be cut away for an extension to be made to the building.

The late Dr. Pliny Earle, who presided over this institution for many years, was a great lover of trees, shrubs and natural scenery, and many fine specimens of trees may be seen in the grounds. Among some I noticed particularly was a good specimen of the English Oak, Quercus Robur, also a fine English Ash. Near one corner of the building was a Magnolia acuminata thirty-five feet in height and a perfect specimen. Some fine groups of Exochorda grandiflora, Cercis Canadensis, Amelanchiers and many other spring-blooming shrubs are to be found here. Farther away from the building are tracts of woods which have received intelligent care. The greenhouses belonging to the institution contain a useful collection of foliage and flowering plants, the Begonias being exceptionally well grown and the Roses remarkably vigorous.

Botanic Garden, Northampton, Mass. *Edward J. Canning.*

Pyrus coronaria.

To the Editor of Garden and Forest:

Sir,—The native Crab Apple has rarely appeared so beautiful at the time of flowering as in the spring just past. As was remarked in Garden and Forest, May 27th, the flowers do not appear till the leaves are partly grown, so that they are somewhat hidden by the young foliage. This is less noticeable here than in the east, for the interval between the opening of the leaf-buds and flower-buds is shorter. But this year the season was peculiar; their development was practically synchronous, and the leaves were so small when the flowers were fully expanded as to be obscured or almost hidden, enough of the green color coming into sight to set off the pink and white of the buds and flowers and make a beautiful combination. The flowers were uncommonly plentiful. It is doubtful if a finer display could be made by any native floral tree than the wild Crab showed under these conditions, especially when the trees stood alone, or partially in the open ground bordering the Oak woods, or lined the banks of a stream. They were so bright as to be visible a long way off, masses of pink dotting the meadows and pastures, or appearing in relief against the groves of Oak, around whose expanding leaves of yellow and red and hanging tufts of flowers a misty light was playing. All combined to make a fairy scene of the woods and fields in those summer days in spring, a picture long to be remembered. They were a month in advance of their usual flowering season, which in ordinary years is from the 20th of May to the end of the month. This year they began to open by the 25th of April, and I saw them at their best on the 29th—a month earlier than I found them in flower last year, when in the higher parts of the finger-lake region of western New York.

Another feature of the blossoms this year struck me as unusual. They are generally so fragrant as to perfume the air for some distance away, and the first reminder of their presence in the denser parts of the woods may be a sniff of the air laden with their delicious aroma. The fragrance in the season just past was so subdued as to be barely perceptible when standing close by the trees. I have wondered whether this loss of fragrance was made at the cost of their rapid development, because more time was needed for its perfection. I have since remarked the same condition in the case of our wild Grapes. Seasons peculiar as this has been are rare, when the cold of the early part retarded vegetation, and a continuous summer heat suddenly setting in hastened growth with remarkable rapidity. It is difficult to correlate observations of this kind, but the facts were evident and may well be kept in mind.

Chicago, Ill. *E. J. Hill.*

Meetings of Societies.

The So-called Exhaustion of Nursery Lands.

THE most vital question with nurserymen at the present time is that of the unproductiveness of lands which have grown one crop of trees. All nurserymen declare that one crop of fruit-tree stock cannot immediately follow another with any assurance of success. This important question received serious consideration in an address by Professor L. H. Bailey before the American Association of Nurserymen at Indianapolis last year, in the tenth report of the New York State Experiment Station and in Bulletins 102 and 103 of the Cornell Station. Professor Bailey discussed the subject more specifically at the meeting of the Nurserymen's Association in Chicago, on the 11th instant, and some of the points which he made are here given:

a. THE FERTILITY OF THE SOIL.

There are two analytical means of determining the fertility of the land. One method determines the chemical constitution, and the other the mechanical or physical condition.

Chemistry determines the amount and kind of plant-food in the soil, but it cannot tell just how useful this food may be to the plant. This depends upon the physical condition of the land, or upon the relation of the soil to warmth, moisture, air and mechanical constitution. The plant is not simply a passive agent, taking in the food which is presented to it, but it is actively engaged in searching for and appropriating food.

The actual fertility of the soil depends, therefore, upon the plant as well as upon the land. The better and more comfortable the plant, the more food it can appropriate from a given soil; hence that soil is practically the richer. The chemist does not determine the physical conditions which make the plant comfortable and active. In other words, the amount of plant-food in the soil is only one of the elements in the fertility of the land.

In most instances as much depends upon the physical condition of the soil as upon its chemical constitution, and in many cases even more depends upon it.

Soil is derived from two sources—rock and organic matter. Each is essential to it. Without the rock matter it would lose body and staying qualities. Without the organic matter it would lose life or heat and activity.

Nature adds the organic matter to the soil by growing plants upon it and then incorporating their remains with it. Everywhere the process of soil-building is now going on. The longer the soil is in crops the richer it becomes, although the relative amount of mineral matter which it contains is decreasing at the same time.

Nature makes the soil richer, then, both by fining and digesting the mineral matter and by ameliorating its physical condition through the incorporation of humus or organic matter.

This fining process must ultimately cease, but the addition of humus never ceases. The final and complete enrichment of the soil, therefore, must come largely as the result of the incorporation of humus with it.

The chief value of this humus is not to directly afford plant-food, but to improve the conditions of temperature, moisture, aeration and the like.

b. MAN'S TREATMENT OF THE LAND.

Man's chief desire is to remove organic matter from the soil. He consumes the plant product. As a consequence, cultivated soils soon tend to become hard, dense, heavy and lifeless, and the more clay-like the land the more pronounced is the result.

The best and richest farm soils are those which are loamy—that is, those which are friable, soft and dark-colored. This loamy condition is brought about by the addition of stable-manures and green crops.

Every ordinary soil tends to lose its humus sooner than its plant-food, and most so-called exhausted soils are injured in their physical condition rather than exhausted of their fertility.

It follows, therefore, that the addition of mere plant-food cannot entirely restore the generality of worn-out lands. The physical condition must always receive first attention. The addition of commercial fertilizers is not a fundamental corrective of poor lands in the vast majority of cases. It should be considered as a supplement to the treatment of the land by means of tillage and cropping.

If man's reward from the cultivation of the land is so unlike nature's, it follows that one cannot copy the practices of nature in the treatment of the land. Yet, in every generation, there are men who proclaim that because nature neither plows nor tills, therefore man should not. The only infallible guide to the proper treatment of the soil is experience, not science, nor speculation; but science explains the laws and directs the application of them when once experience has discovered them.

In fact, experience is law, for experience that persists is that which gives consecutively uniform results under like conditions. All experience proves that frequent tillage and the addition of humus quickly and invariably ameliorate and improve the soil. It is folly to attempt to controvert the facts by mere speculation. On the other hand, experience proves that the addition of chemical fertilizers does not invariably visibly benefit the soil; therefore the value of such applications must depend upon local or transient conditions.

c. THE NURSERY LANDS.

The best nursery lands, at least in New York state, are those which contain much clay. This soil is the most easily injured by unwise or careless treatment and by the loss of organic matter.

The nursery crop occupies the land for three to five years. During all this time the land receives no addition of organic matter, and finally even the roots are taken out of it. In very many cases the trees are planted and dug when the soil is wet or very dry, and, therefore, quickly and very seriously injured in its "grain," or its physical condition.

Nurserymen find that if the land is rested in Clover or Grass for a few years it will again grow trees. This rotation, like all others, is a means of ameliorating the physical condition of the soil as well as the chemical condition of it. A part of the rotation must aim at the incorporation of humus. Therefore every famous rotation has a rest crop in it.

An incidental advantage of any rotation is the variety of tillage imposed by it. A rotation of tools and of methods, and seasons of working the land, is often as important as the other results of alternate cropping.

[Extended figures of chemical analyses of nursery stock were presented, showing that the amounts of potash, phosphoric acid and nitrogen which such stock removes from the land is really very small, and less than that removed by similar bulk or weight of corn or wheat. Experiments now being made by Professor Bailey were cited, and these showed that the addition of concentrated or chemical manures to nursery-lands does not promise very important results; but Professor Bailey has greater hopes from experiments in the sowing of Crimson Clover and other cover crops in the nursery rows, and in the use of stable-manures. He cited instances of excellent results following the addition of stable-manure to nursery-lands between the trees in the fall; an instance was given of a piece of land so treated which has grown excellent Plum-trees for twenty consecutive years. Examples were also given to show that there is no necessary reason why nursery stock should not follow nursery stock as well as wheat follow wheat, except that the land is usually more clay-like, the rotation or cropping is longer, and the addition of humus or fibre to the soil is less.]

d. THE CONCLUSIONS.

The difficulty then is not one of amount of plant-food, so much as of the availability of that food by improving the physical conditions of the soil. The soil must be warm, soft, mellow, and the plant must be comfortable.

The trouble is, not that nursery trees take so much from the soil, but that the rotation is too long, the fibre is burned out of the soil, and much of the working of the land is untimely.

Certain lands are not readily injured by nursery cultivation, and these may grow several continuous crops of trees.

Now and then the nurseryman can augment the growth of his stock by extra attention to tillage (it is assumed that he always tills well) and by the addition of some quick nitrogen compound, as nitrate of soda; but these are generally only temporary correctives. The complete or fundamental corrective for nursery-land is rotation; but the length of this rotation may often be shortened, or even entirely reduced by the judicious intracultural use of stable manures and cover crops.

The conclusion was made that the physical condition of the soil is a subject of greater or earlier importance than its chemical constitution; that the value of rotation of crops lies largely in its ameliorating effect upon the physical condition; and that nursery-lands are no exception in demanding such rotation. Instead of thinking it strange that trees do not readily follow trees, we should rather think it strange if they did. Because the crop is of several years' duration, it becomes necessary that the alternating cropping should also be ex-

tended. A system of rotations must be practiced in blocks of years, not in single years. But this alternating cropping can be greatly shortened by giving greater attention to the addition of fibre to the soil while the nursery stock is growing. There are instances in which the alternation may be made short, and some in which there need be hardly any. Professor Bailey said that he did not look for a general corrective of the depletion of nursery-lands, therefore, by the addition of concentrated or chemical fertilizers, but by better management of the lands.

Notes.

Lima beans, from Virginia, the first of this season, sell for forty cents a half-peck, the pods but poorly filled, and Windsor or Broad beans at the same price. Corn is now coming from southern New Jersey, and costs fifty cents a dozen.

It was reported not long ago that among the twenty young women thus far graduated from the Horticultural College at Swansey, eight were growing fruit or vegetables for the market, one was the manager of a bulb-growing nursery and two were the managing gardeners of large estates, while the other eight were utilizing their acquirements at home.

The old home of the naturalist, Audubon, in Pennsylvania, is on the south bank of the little River Perkiomen, about three miles to the eastward of Phœnixville. The house, which is locally famous as the Mill Grove House, was built nearly a century and a half ago, and stands on a knoll which affords a fine prospect. It is of stone, solid and substantial, thickly overgrown with Ivy and shadowed by a number of tall Pines, under the branches of which Audubon produced some of his best work. In spite of certain interior changes, the chimney-corner where his studying was done still remains as he knew it.

The large white flowers and the purple stamens of the native shrub Stuartia Virginica were lately seen in flower in the Meehan nurseries, in Germantown, Pennsylvania, and the buds of S. pentagyna were about opening. A large specimen of Pterostyrax hispidum, twenty feet high and as many feet across, was covered with hundreds of racemes of drooping white flowers. These give a fringe-like character which resembles somewhat that of the Chionanthus. It seeds freely. Cedrela Sinensis was again in flower in these nurseries, as it was last year, the greenish white flowers borne on panicles two to three feet in length, and pendulous from the ends of the branches. The tree resembles Ailanthus glandulosa in appearance, but the flowers are entirely without odor.

A large variety of fruits is now shown in this city. All the berries are offered, as raspberries, blackberries, huckleberries, strawberries, currants and gooseberries. Cherries from western New York are plentiful. The first Le Conte pears are here from Florida, with the last apples from cold storage. The first grapes of the season, Niagaras, also came from Florida last week. Botan plums are coming from the same state, and the small Chickasaw and showy Wild Goose plums from the southern Atlantic coast states. There are apricots, peaches, plums and cherries from California, besides peaches from Florida and Georgia. Oranges and lemons are, of course, seen in the collections, and occasionally grape-fruit in excellent condition; medium-sized smooth specimens cost twenty cents each. Watermelons are coming by the car-load and by steamer; one boat from Savannah on Friday discharged thirty-three car-loads. Some large ripe muskmelons have been coming from New Orleans, but most of this fruit from South Carolina and Florida is small and immature.

The smudge fires which are kindled in orchards to raise a screen of smoke as a protection against frost are only effective, says Mr. F. C. Barker in the *Irrigation Age*, on a broad flat expanse of land, for in narrow valleys the cold air flows down from the hill-sides underneath the smoke. The smoke, like clouds, only acts as a screen to prevent radiation. Of course, the heat from the fires has practically no effect in reducing the intensity of the cold, but the efficiency of the fires may be greatly increased by spraying them with water, so as to add vapor to the atmosphere, and in this manner raise the dew-point, which is reached at a higher temperature when the vapor of the air is increased. Without this spraying the heat would otherwise establish an upward current of warm air which would rise above the space which required protection; while if water is sprayed on the fires the heat is utilized in forming vapor which is distributed through the lower strata of air, where it is most needed. As soon as this vapor is condensed at the dew-point this latent heat is set free and tends to raise the temperature.

The Apple orchards of Tasmania, from which a great deal of fruit is shipped to England every spring, have a very different appearance from those of western New York, for example. The trees are planted closely, sometimes twelve feet apart each way, but usually sixteen feet apart each way. They have a short main trunk or none at all, with from five to nine main branches starting as nearly as possible from the ground and forming an inverted cone open in the centre. Each of these branches is kept covered with fruit spurs as nearly as possible down to the ground, and, therefore, a large portion of the apples are borne below the point where our own trees carry any fruit at all. Summer pruning is practiced before the apples have matured, so as to check prolific growth and encourage fruiting, and partly to let the sun in and give the apples color. This also is the reason for having the centre of the tree open, because the fruit does not color as well as it does in climates which are drier and more sunny. In some cases a stake is driven into the ground near the trunk and passes up through the centre of the tree, and the branches are supported by binder's twine attached like umbrella braces to this central stake. In other cases props are used to hold up the limbs. A very interesting description of these orchards, with illustrations showing the low and closely pruned trees loaded with fruit, is found in *The Garden and Field*, published in Adelaide, South Australia.

The American Association of Nurserymen held its twenty-first annual meeting at the Sherman House, in Chicago, on the 10th and 11th instant. Of the various horticultural trade organizations of this country this association holds the chief place in the broad and catholic spirit of its management. Its purpose is the serious acquisition and diffusion of knowledge in all that pertains to the growing of woody plants, not only in the nursery, but in the orchard and on the lawn. Its membership is comprised almost wholly of the owners and managers of nursery businesses, and these are men whose sympathies are necessarily as broad as the cultivation of plants itself. A large part of its function must always be social, but its meetings are happily free from that type of conviviality which is often the discredit of trade or special gatherings. The chief interest in the Chicago meeting centred in questions relating to customs tariff on nursery-stock, and a committee (W. C. Barry, J. H. Hale, N. H. Albaugh) was appointed to aid in securing additions to the present tariffs; in the laws designed to prevent the free exchange of nursery-stock for the purpose of checking the spread of the San José scale and other pests, and which were condemned because considered to discriminate unjustly and to fail of their ostensible purpose; in the causes for the decline in prices of nursery-stock; and in the means of maintaining the productiveness of nursery-lands. The association is to meet in St. Louis in 1897, and its new officers are Silas Wilson, Iowa, President; E. Meissner, Missouri, Vice-President; George C. Seager, Rochester, New York, Secretary; N. A. Whitney, Illinois, Treasurer.

It will be of much interest to the scientific and gardening world to learn the extent of the damage done to the Missouri Botanical Garden by the destructive tornado that recently visited St. Louis. The garden was in the direct path of the wrecking wind at its extreme western point. As this was the starting point of the destruction the garden suffered less severely than the region just to the east, though the damage was considerable, more especially in the timbered portion. Something like 160 trees were either uprooted or broken off so near the ground that it was found necessary to take them out. Many of these were rare and choice plants, and an estimate of their value would be impossible. More than 250 trees were seriously damaged, many of them having their tops almost entirely carried away. Some of these, by judicious pruning, will, in a few years, grow to be beautiful trees again, while it is probable that a few will die. The shrubbery was badly whipped, but the damage to it was comparatively slight. The herbaceous plants were almost totally destroyed in the exposed places, but these are now all replaced by reserved stock. The grounds are rapidly being put in order, and in a month it is expected that all vestige of the storm will have been cleared away and only the vacant places left to indicate its awful work. It is fair to say that the damage is not so great as to mar the beauty of the garden nor to impair its usefulness as a place of instruction. In these particulars it will not suffer in the least. The injury to the buildings was mainly in broken windows and damaged roofs. The glass portion of the roof of one large greenhouse was entirely demolished, and the roof of the southern half of the herbarium and library building was carried away. By prompt action of the employees in the library building its contents received no damage whatever.